AMENDMENT(S) TO THE CLAIMS

Please amend claims 1 and 21 as follows. This listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims:

1. (Currently amended) Crane or excavator for the transaction of a load, which comprises:

a) a load cable for carrying the load,

b) a turning mechanism for the rotation of the crane or excavator,

c) a seesaw mechanism for the erection or incline of an extension arm and

d) a hoisting gear for the lifting or lowering of the load which is carried by a cable with an actuation system,

said crane or excavator being further characterized by

e) a track control system (31), including a control system (41) for optimized movement and guidance of the load, the control system (41) comprising an optimized control function based on an optimization of control parameters for providing an optimal control trajectory,

wherein said control function dynamically calculates time functions for control voltages for moving the load with minimized oscillation amplitudes, and

wherein said control parameters include:

i) a plurality of set points as input values for describing a pre-determined position and orientation of the load at one or more load positions along said calculated trajectory from an initial starting point to an end point , and

ii) feedback from at least one status variable

~~whose starting points u_{outD}, u_{outA2}, u_{outD}, u_{outR}) go directly into a control system (41) for controlling the position and/or speed of the crane or excavator as input values for position or speed of the crane or excavator, whereas set points for the track control system (31) are generated for moving the load with minimized oscillation amplitudes.~~

2. (Previously presented) Crane or excavator in accordance with claim 1, wherein the track control system 31 includes a model based optimal control trajectory which is calculated and updated in real time.

3. (Previously presented) Crane or excavator in accordance with claim 2, wherein the model based optimal control trajectory is based on a model which is linearized by reference trajectories.

4. (Previously presented) Crane or excavator in accordance with claim 2, wherein the model based optimal control trajectory is based on a non-linear model approach.

5. (Previously presented) Crane or excavator in accordance with claim 2, wherein the model based optimal control trajectory includes feedback of all status values.

6. (Previously presented) Crane or excavator in accordance with claim 2, wherein the model based optimal control trajectory includes feedback of at least one measured variable and estimation of the remaining status values.

7. (Previously presented) Crane or excavator in accordance with claim 2, wherein the model based optimal control trajectory includes feedback of at least one measured variable and set point tracking of the remaining status values by model based feed forward control.

8. (Previously presented) Crane or excavator in accordance with claim 2, wherein the track control system (31) is implemented as fully automatic or as semi-automatic.

9. (Previously presented) Crane or excavator in accordance with claim 1, wherein a set point matrix (35) for position and orientation of the load is entered as an input value into the track control system (31).

10. (Previously presented) Crane or excavator in accordance with claim 1, wherein the set point matrix (35) comprises a start point and arrival point.

11. (Previously presented) Crane or excavator in accordance with claim 1, wherein a desired arrival speed of the load is entered into the track control system (31) by the position of the hand lever (34) in case of a semi-automatic operation.

12. (Previously presented) Crane or excavator in accordance with claim 11, wherein measuring values of the positions of crane and load are measured via sensors and entered into the track control system (31) in case of a semi-automatic operation.

13. (Previously presented) Crane or excavator in accordance with claim 11, wherein positions of crane and load are estimated in a module for model based estimation processes (43) and entered into the track control system (31).

14. (Previously presented) Crane or excavator in accordance with claim 1, wherein the values (u_{outD}, u_{outA}, u_{outL}, u_{outR}) are entered first into an underlying control system with load oscillation damping.

15. (Previously presented) Crane or excavator in accordance with claim 14, wherein the load oscillation damping system has at least one track planning module, one centripetal force compensation device, one axis controller for the turning mechanism, one axis controller for the seesaw mechanism, one axis controller for the hoisting gear and one axis controller for the turning mechanism.

16. (Previously presented) Crane or excavator in accordance with claim 1, wherein the movement of the load can be specified in such a way by the track control system (31), that pre-determined free areas cannot be left by the oscillating load.

17. (Canceled)

18. (Previously presented) Crane or excavator in accordance with claim 3, wherein the model based optimal control trajectory includes feedback of all status values.

19. (Previously presented) Crane or excavator in accordance with claim 4, wherein the model based optimal control trajectory includes feedback of all status values.

20. (Canceled)

21. (Currently amended) Crane or excavator for the transaction of a load, which comprises:

a) a load cable for carrying the load,

b) a turning mechanism for the rotation of the crane or excavator,

c) a seesaw mechanism for the erection or incline of an extension arm and

d) a hoisting gear for the lifting or lowering of the load which is carried by a cable with an actuation system,

said crane or excavator being further characterized by

e) a track control system (31), including a control system (41) for optimized movement and guidance of the load, the control system (41) comprising an optimized control function based on an optimization of control parameters for providing an optimal control trajectory,

wherein said control function dynamically calculates time functions for control voltages for moving the load with minimized oscillation amplitudes, and

wherein said control parameters include:

i) a plurality of set points as input values for describing a pre-determined position and orientation of the load at one or more load positions along said calculated trajectory from an initial starting point to an end point , and

ii) feedback from at least one status variable

~~whose starting points u_{outD}, u_{outA2}, u_{outD}, u_{outR} go directly into a control system (41) for controlling the position and/or speed of the crane or excavator as input values for position or speed of the crane or excavator, whereas set points for the track control system (31) are generated for moving the load with minimized oscillation amplitudes~~.

22. (Previously presented) The crane or excavator of claim 21 wherein the track control system (31) includes a model based optimal control trajectory which is calculated and updated in real time.